

A Revisional Study of the Taiwanese Scarabaeinae (Coleoptera, Scarabaeidae)

Part 3. Descriptions of a New Species and a Male of Known Species,
Lectotype Designation, and Downgrading of an *Onthophagus* Species

Kimio MASUMOTO

Institute of Human Living Sciences, Otsuma Women's University, Tokyo, 102–8357 Japan,

Jing-Fu TSAI

Department of Entomology, National Chung Hsing University, Taichung, Taiwan 402, ROC

and

Teruo OCHI

21–6, Kôfûdai 5-chôme, Toyono-chô, Toyono-gun, Osaka, 563–0104 Japan

Abstract This is the third part of a revisional study of the Taiwanese Scarabaeinae. *Onthophagus* (s. str.) *yangi* sp. nov. is described. The lectotype is designated for *Onthophagus turmalis* GILLET. The male of *Cassolus gotoi* MASUMOTO is described. *Onthophagus hiurai* OCHI is regarded as a subspecies of *O. potanini* KABAKOV.

The authors have been studying on Taiwanese dung beetles for these five years, particularly on the species of the subfamily Scarabaeinae. In the first part of this series (MASUMOTO *et al.*, 2004 a), they described two new *Onthophagus* species from Taiwan. In the second part (MASUMOTO *et al.*, 2004 b), they also described two other new species, an *Onthophagus* and a *Sinodrepanus*, and male specimens of two known *Onthophagus* species.

In the third part, they are going to describe a new *Onthophagus* species and a male of *Cassolus gotoi* MASUMOTO, 1986, and to designate the lectotype for *Onthophagus turmalis* GILLET, 1924. Finally, they are going to regard *Onthophagus hiurai* OCHI, 1984 as a subspecies of *O. potanini* KABAKOV, 1979.

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examining the type series of *Onthophagus turmalis* GILLET, 1924, and Dr. Makoto KIUCHI, Tsukuba City, for taking very clear photographs inserted in this paper.

The abbreviations used herein are as follows: NCHU — National Chung Hsing University, Taichung; NMNST — National Museum of Natural Science, Taichung; NSMT — National Science Museum (Nat. Hist.), Tokyo; IRSNB — Institut royal des Sciences naturelles de Belgique; RCBAST — Research Center of Biodiversity, Academia Sinica, Taipei; TFRI — Taiwan Forestry Research Institute.

***Onthophagus* (s. str.) *yangi* sp. nov.**

(Figs. 1, 4–5)

Brownish black, anterior margin of head and legs dark reddish brown, antennal footstalks, mouth parts and gula lighter in colour; head and pronotum with feeble dark coppery lustre, elytra gently, somewhat vitreously shining; each surface almost glabrous. Body ovate and compact, gently convex above.

Male. Head slightly transverse, rather strongly punctate; clypeus gently inclined anteriad, with apical margin weakly reflexed in front and angulate on each side, fronto-clypeal border produced anteriad and feebly raised; genae (ocular lobes) obtusely angulate laterad, fronto-genal and clypeo-genal borders continuously sulcate, the sulcations reaching outer margins; frons somewhat triangular, with basal part deeply concave, the concavity reaching vertex; vertex with a pair of upright horns at the middle of eyes, of which posterior parts are connected with each other in the middle of vertex, and anterior parts extend to fronto-genal sulcations.

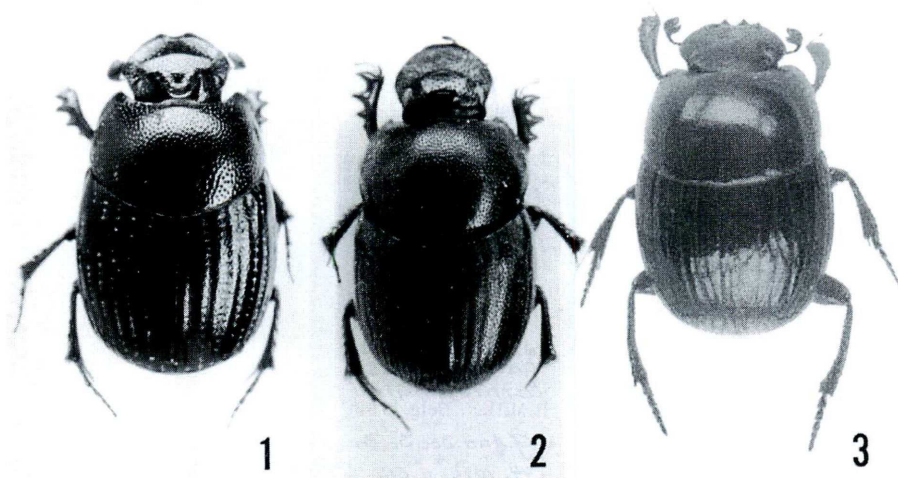
Pronotum transverse (7 : 5), gently narrowed apicad; apex moderately and widely emarginate, with a short, membranous part attached in medial 1/6; base almost rounded, slightly angulate at the middle; sides rather steeply declined to lateral margins, which are finely rimmed; front angles obtuse, hind angles rounded; disc rather closely punctate, the punctures in central part not so large, feebly ovate, those in lateral parts becoming closer and coarser.

Elytra shallowly punctato-striate, the striae finely ridged on each side, the punctures in striae seemingly transverse under low magnification, but actually they consist of a pair as confirmed under high magnification ($\times 30$ – 40); intervals rather wide, gently convex, scattered with small punctures, weakly, irregularly wrinkled.

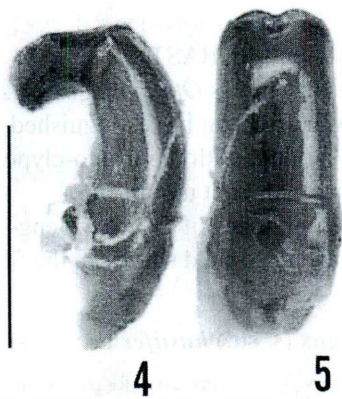
Pygidium gently convex, rimmed, scattered with shallow umbilicate punctures. Metasternum gently triangularly inclined in anterior part, metasternal shield punctate, the punctures in medial part becoming sparser, with a shallow groove along the mid-line in posterior 1/4.

Legs rather bold; protibia with four outer teeth; terminal spur boldly pointed and gently curved ventrad; ratios of the lengths of metatarsomeres and terminal spur of metatibia: 1.00, 0.48, 0.35, 0.26, 0.48; 0.81.

Female. As compared with male, fronto-clypeal ridge longer, posterior part of frons and vertex gently raised, with gentle declivity along the border of the anterior



Figs. 1–3. Habitus of *Onthophagus* and *Cassolus*. —1, *O. yangi* sp. nov., male, holotype; 2, *O. turmalis* GILLET, male, lectotype (= *Onthophagus* (s. str.) *hastifer* LANSBERGE); 3, *C. gotoi* MASUMOTO, male.



Figs. 4–5. Male genitalia of *Onthophagus yangi* sp. nov. (4, lateral view, 5, dorsal view).

part of frons, instead of a pair of cephalic horns.

Body length: 4.3–4.6 mm.

Holotype: ♂, Wuling, Shei-pa National Park, N. Taiwan, 1–V–2004, K. MASUMOTO leg. (NMNST). Paratypes: 1 ex., same data as for the holotype (NSMT); 1 ex., same data as for the holotype (NCHU); 5 exs., Fushan Research Station, TARI, Yilan Co., 28–V–2003, J.-F. TSAI & T.-C. WANG leg.; 4 exs., Fushan Botanical Garden,

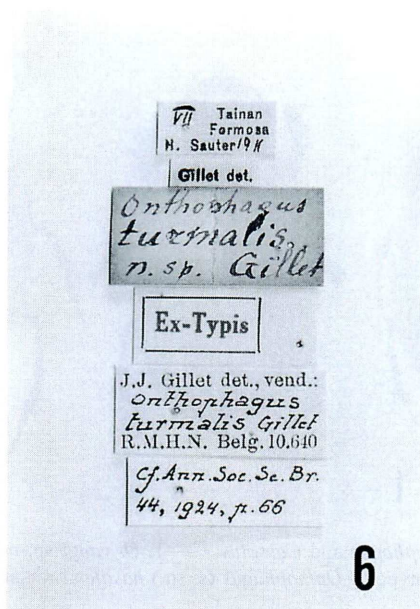


Fig. 6. Type label of *Onthophagus turmalis* GILLET.

Yilan/Taipei Co., 3-V-2004, K. MASUMOTO leg.; 4 exs., "Fushan Research Station, TFRI, III-2001, Wenbe HWANG leg. (RCBAST)".

Notes. This new species resembles *Onthophagus* (s. str.) *masumotoi* OCHI, 1985, originally described from Taiwan, but can be distinguished from the latter by the body a little larger and moderately shining, with the fronto-clypeal ridge stronger, the punctures on the dorsal surface sparser and not umbilicate.

The specific name is given in honor of Prof. Dr. Jeng-Tze YANG, National Chung Hsing University, who kindly arranged field survey in the Shei-Pa National Park.

Onthophagus (s. str.) *hastifer* LANSBERGE, 1885

Onthophagus hastifer LANSBERGE, 1885, Annli. Mus. civ. Stor. nat. Genova, **2**: 380. Type locality: Minhla, Birmanie.

Onthophagus turmalis GILLET, 1924, Annls. Soc. Sci. Brux., **44**: 66. Type locality: Tainan. (Holotype: Figs. 2, 6).

Onthophagus agilis MATSUMURA, 1938, Ins. matsum., Sapporo, **12**: 56. Type locality: Chokakurai (Shaochia). [*Syn. nov.*]

Onthophagus putealis MATSUMURA, 1938, Ins. matsum., Sapporo, **12**: 61. Chokakurai (Shaochia).

Distribution. Taiwan, C. & S. China, Vietnam, Annam, Myanmar, Thailand.

Lectotype designation for *Onthophagus turmalis* GILLET: Lectotype, ♂, labeled as follows: VII Tainan/Formosa/H. Sauter 1911 // Gillet det. // *Onthophagus / turmalis / n. sp. Gillet* // J.J. Gillet det., vend.: / *Onthophagus / turmalis* Gillet / R.M.H.N. Belg.

10.640 // Ex-Typis // cf. Ann. Soc. Sc. Br. / 44, 1924, p. 66. Paralectotypes: 8 exs., same data as for the lectotype; 5 exs., VII Tainan 11 / Formosa / H. Sauter // Gillet det. // J. J. Gillet det., vend.: / *Onthophagus / turmalis* Gillet / R.M.H.N. Belg. 10.640 // Ex-Typis // cf. Ann. Soc. Sc. Br. / T. 44, 1924, p. 66; 1 ex., VII Tainan / Formosa / H. Sauter 11 // Gillet det. // J. J. Gillet det., vend.: / *Onthophagus / turmalis* Gillet / R.M.H.N. Belg. 10.640 // Ex-Typis // cf. Ann. Soc. Sc. Br. / T. 44, 1924, p. 66; 1 ex., VII 11 Tainan / Formosa / H. Sauter // Gillet det. // J. J. Gillet det., vend.: / *Onthophagus / turmalis* Gillet / R.M.H.N. Belg. 10.640 // Ex-Typis // cf. Ann. Soc. Sc. Br. / T. 44, 1924, p. 66. [All the types are preserved in IRSNB.]

***Cassolus gotoi* MASUMOTO, 1986**

(Fig. 3)

Cassolus gotoi MASUMOTO, 1986, Ent. Rev. Japan, Osaka, **41**: 85.

This species was described on a single female from Hewangshan, Nantou Hsien, Central Taiwan. Recently, the authors were able to obtain a male specimen to be additionally described below:

As compared with a female, head and pronotum more evenly, slightly more sparsely scattered with small punctures. Metatibia longer and more strongly curved, with inner face distinctly crenate. Ratios of the lengths of metatarsomeres and terminal spur of metatibia: 0.28, 0.22, 0.21, 0.19, 0.31; 0.36.

Body length: 5.9 mm.

Specimen examined. 1 ♂, Fushan Botanical Garden, Yilan Hsien, N. Taiwan, 28-V-2003, J.-F. TSAI & T.-C. WANG leg. (NMNST).

***Onthophagus (Strandius) potanini hiurai* OCHI, 1984**

Onthophagus (Strandius) hiurai OCHI, 1984, Ent. Rev. Japan, Osaka, **39**: 63. Type locality: Sungkang (Sungkang).

Onthophagus angulatus: MIWA, 1930, Ins. matsum., Sapporo, **4**: 168. Collected localities: Kankau (Gangkou), Arisan (Alishan), Rantaizan (Luandashan, Sinyi, Nantou Hsien). [Nec REDTENBACHER, 1848].

Onthophagus gagates: NOMURA, 1973, Ent. Rev. Japan, Osaka, **25**: 47. Collected localities: Sungkang, Wushe, Funchiifo (Fenchihu). [Nec HOPE, 1831].

[*Onthophagus (Phanaeomorphus) potanini* KABAKOV, 1979, in Beetles of Far East and East Siberia, 80. Type locality: NE-China, Shen'iang Prov., Tsun-chzha-lo and Tao-Guan.]

Distribution. C. Taiwan.

Notes. The present subspecies can be easily distinguished from the nominotypical one by the following characteristics:

Elytra a little wider, with intervals rather densely covered with stronger and slightly larger punctures; head with anterior margin more deeply and noticeably notched at the clypeo-genal junction on each side, and clypeal margin more strongly produced and more clearly reflexed at the middle in male; head with clypeus a little

wider at base, and less noticeably notched at the clypeo-genal junction in female.

要 約

益本仁雄・蔡 經甫・越智輝雄：台湾産タマオシコガネ亜科の再検討。その3。エンマコガネ属の1新種および *Cassolus* 属の既知種雄の記載，後基準標本の指定，そして亜種降格について。——台湾産タマオシコガネ亜科エンマコガネ属の1新種 *Onthophagus* (s. str.) *yangi* sp. nov., および *Cassolus gotoi* MASUMOTO の雄を記載した。また，*Onthophagus turmalis* GILLET (= *Onthophagus* (s. str.) *hastifer* LANSBERGE) の後基準標本を指定するとともに，*Onthophagus hiurai* OCHI を *O. potanini* KABAKOV の亜種とした。

References

- GILLET, J. J., 1924. Descriptions d'*Onthophagus* nouveaux d'Asie tropicale. *Annls. Soc. Sci. Brux.*, **44**: 66–70.
- KABAKOV, O. N., 1979. Review of scarab beetles of subfamily Coprinae (Scarabaeidae, Coleoptera) of Far East of USSR and adjacent countries. *In: Beetles of Far East and East Siberia*, 58–98. (In Russian.)
- LANSBERGE, J. W. VAN, 1885. Descriptions d'espèces nouvelles de Coléoptères appartenant au musée civique de Gênes. *Annli. Mus. civ. Stor. nat. Genova*, **2**: 375–400.
- MASUMOTO, K., 1986. New coprophagous Lamellicornia from Japan and Formosa, 3. (Coleoptera, Scarabaeidae). *Ent. Rev. Japan, Osaka*, **41**: 85–87.
- , K.-M. CHEN & T. OCHI, 2004 a. A revisional study of the Taiwanese Scarabaeinae (Coleoptera, Scarabaeidae). 1. Two new *Onthophagus* species from Taiwan. *Elytra, Tokyo*, **32**: 125–131.
- , M.-M. YANG & T. OCHI, 2004 b. Two new species and males of *Onthophagus roubali* and *O. hsui*. *Ibid.*, **32**: 371–365.
- MATSUMURA, S., 1938. Onthophagid-insects from Formosa. *Ins. matsum., Sapporo*, **12**: 53–63.
- MIWA, Y., 1930. An enumeration of the coprophagid-Coleoptera from Formosa, with a table of the geographical distribution, *Ibid.*, **4**: 163–180.
- NOMURA, S., 1973. Notes on the coprophagous Lamellicornia from Taiwan. *Ent. Rev. Japan, Osaka*, **25**: 37–52.
- OCHI, T., 1984. Two new species of the genus *Onthophagus* LATREILLE from Taiwan and the Ryukyu Archipelago (Coleoptera, Scarabaeidae). *Ibid.*, **39**: 63–67.
- 1985. Notes of the genus *Onthophagus* LATREILLE from Taiwan (Coleoptera, Scarabaeidae). *Ibid.*, **40**: 49–51.